

# Flight

A Journal devoted to the Interests, Practice, and Progress of  
Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE AERO CLUB OF THE UNITED KINGDOM.

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## FLIGHT.

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## TERMINOLOGY IN FLIGHT.

IN the present issue will be found an illustrated glossary of aeronautic terms, which, judging by the correspondence which we have received upon this subject, will prove to be of widespread use and interest to readers of FLIGHT. We are well aware that it will meet with a mixed reception, especially in view of the many letters we have received advocating vigorous terminological reform, which we have in no wise attempted to bring about. But that is quite inevitable at this stage of the new era; and half a loaf is—after all said and done—very much better than no bread. It must be remembered that the development of the practical side of aviation has been attended by the use of machines and devices which have had names coined for them, so to speak, on the spot. And it is just those words which are being used to-day, and which consequently find a place in the glossary we have prepared. In future they may change, their meanings may vary, and new terms will doubtless come into vogue; but it is custom and usage which will effect the final selection, and not any arbitrary pre-arranged rules. "It matters little," said a recent correspondent, "what name is given to a spade, provided we all recognise it by that name and do not mistake it for a shovel." That is, in fact, the very reason why it would be most confusing to abandon any aeronautical terms which are well-defined in daily use merely on the score of a little derivational or basic inaccuracy. The suffix "plane" is, for instance, objected to in our correspondence columns this week

on the grounds that the surfaces are cambered. Truly the word "aerocurve" is more appropriate than "aeroplane;" but why abandon an internationally accepted word when there is at present no need for the distinction we have just implied? Similarly the words "monoplane," "biplane," &c., are quite the best at the present time to classify flying machines of the aeroplane class. And, where there is no natural English equivalent to the names now used in France, we have introduced corresponding words (e.g., elevator, steering tips, warped, &c.) chosen because they are terse and self-explanatory.

Again, considerable discussion has taken place about the use of the word "aerodrome" as a trial ground for flight. But, in this case also, international usage seems to us to justify its adoption—at any rate until we have flying-grounds in full swing. It is only a year or two since there was a scheme afoot to build a "motodrome" at Weybridge, but that place, when built, speedily became "Brooklands," or merely "The Track," and was never a "motodrome" in name.

Similarly, no one knows what sort of flier may be invented next, nor what innovations the well-known machines of to-day may be fitted with. There are many who watch most anxiously for the success of artificial flapping flight by the aid of machines which have been variously named "orthopters" and "ornithopters." Such machines are at present *rarae aves*, and hence the difficulty of deciding upon any basic distinction between the two terms just yet. Strictly speaking, the term "orthopter" denotes nothing more nor less than a something having straight or regular wings; whereas the term "ornithopter" denotes a something having bird-like wings. The question is, therefore, what fundamental qualities of a flapping-flight machine assimilates its wings to those of the bird, as distinct from being straight or regular. So far as we know, the distinguishing qualities of a bird's wing, as such, are two in number, viz., its feather construction and its arched shape. It seems unlikely that many experimenters will go to the trouble of making artificial feathers for their trial machines; and it is doubtful, therefore, whether the absence of a feathered surface should of itself disqualify a machine from the ornithopter class if its wings have an arched section. For the time, at any rate, it may reasonably be deemed advisable to choose the latter distinction, and that is why "orthopter" and "ornithopter" are given in our glossary as referring to machines having, respectively, straight and arched wings. Sufficient has been said to show, however, that this first glossary of ours is admittedly of a provisional nature, even though we have done our best to make it accurate as far as it can go.

## FLYING GROUNDS AT FAMBRIDGE.



FAMBRIDGE FLIGHT GROUNDS.—General view on the land side of the aero dock and aero colony at South Fambridge, showing the huge aero dock on the right.

It is encouraging, to say the least of it, to be able to place before our readers this week some early particulars of a scheme that has been put on foot by one of our own countrymen with the express object of fostering the progress of flight in England, and in a manner that compares most favourably with anything that has hitherto been developed in France. Across the Channel, as everyone knows, flight is already taken as a serious subject and a matter of national import by men of all ranks and classes, patriotic Frenchmen having come forward in their hundreds to do the little or the much of which they are capable in the furtherance of what they rightly deem to be a really great cause. As yet, on the contrary, it has been very difficult to get the same view of the situation accepted at all generally in England; and hence it is all the more satisfactory that a first start is now about to be made.

That, at least, is what Mr. N. Pemberton Billing has set himself out to do, he having already prepared the way for it by purchasing an almost ready-made flying-ground down in Essex that can be placed at the service of aviators by him. Mr. Billing is a sportsman, and is well known as such, especially in the yachting world.

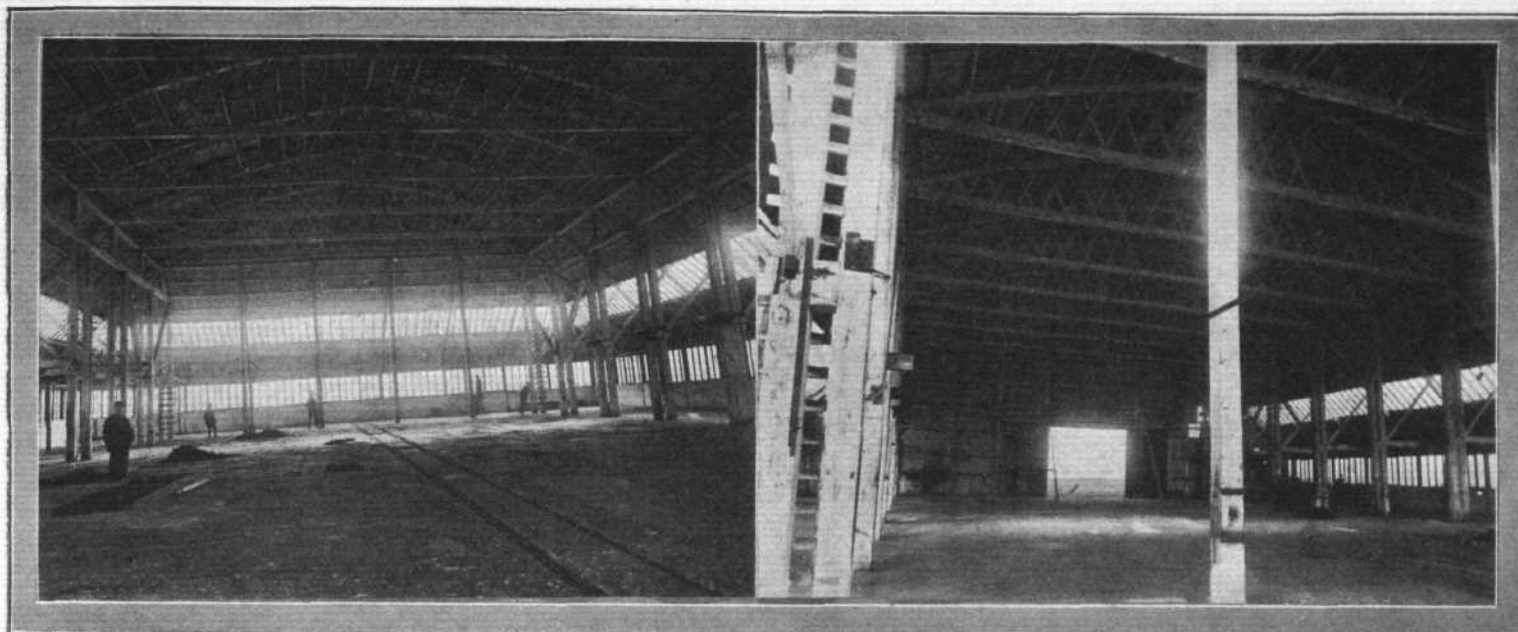
And he is a sportsman of the very type that is needed at the moment, since he has a thorough-going belief in the principle that the man of leisure should, if possible, make his pastime of value to his native land.

Like a good many other people, he is very keen on learning to fly; and, like the rest of us, he is also anxious to see Great Britain in the van of aerial progress. In his opinion, the two ideas are complementary aims which can and should be attained simultaneously; and it is in order to materialise these aspirations that he has taken the preliminary move of securing the vast tract of land to which we have referred. There it is his ambition to bring together other would-be aviators who, like himself, are primarily anxious to learn to fly, but are equally keen on the subsidiary object of placing the experience they thus acquire at the disposal of the country in any time of need. It would be premature to discuss the details of Mr. Billing's full scheme at this initial stage, but sufficient has been said to show that he is not merely launching forth this enterprise with his own money, but that his action is being swayed by motives which are, to say the very least of them, quite the reverse of selfish.



FAMBRIDGE FLIGHT GROUNDS.—Nearer view of the big aero dock, carpenters' shop, drawing office, &c.



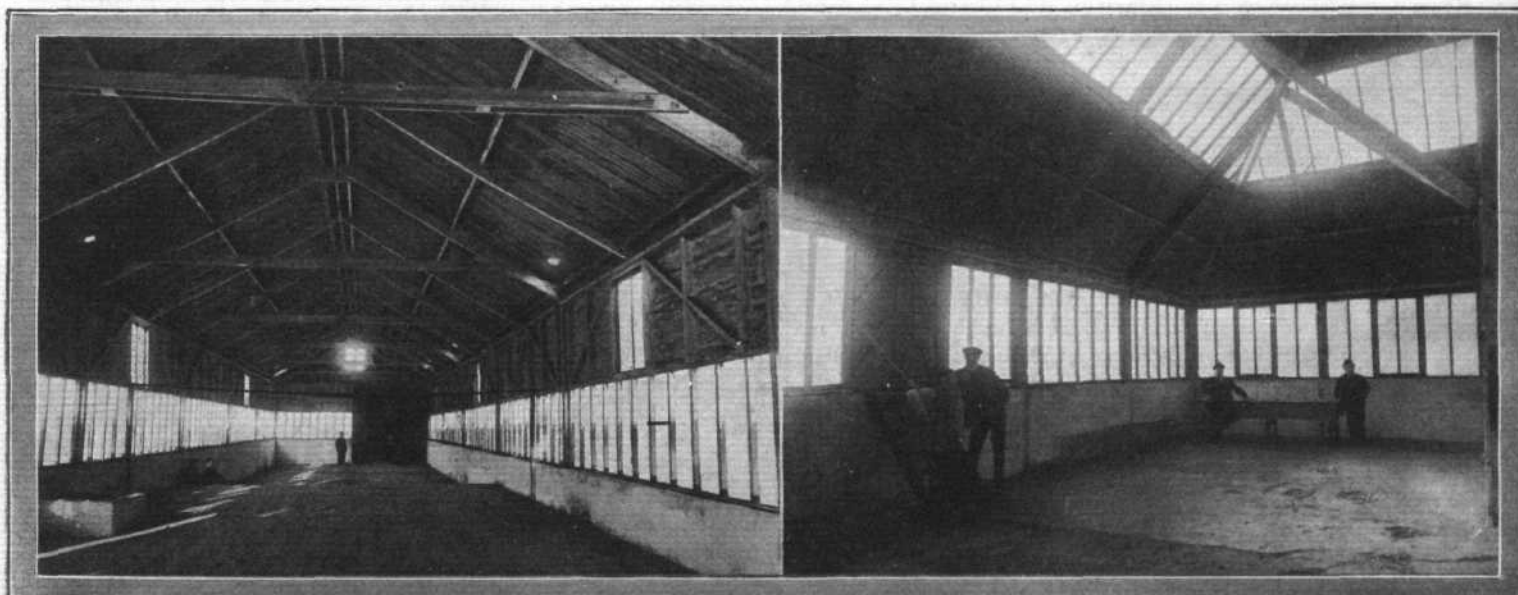


**FAMBRIDGE FLIGHT GROUNDS.**—Two views of the interior of the big aero dock, looking towards each end from about the centre. The private aero docks will be, at the side, enclosed in the bays, which are 26 ft. deep.

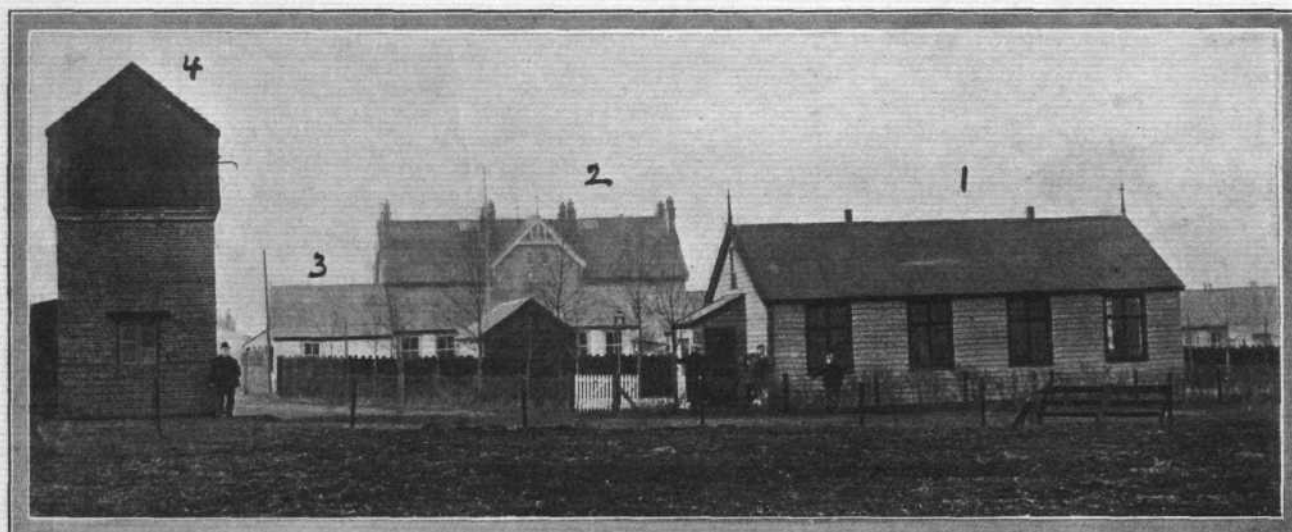
The land which Mr. Pemberton Billing has secured is over 3,000 acres in extent, and lies between the Thames and the Crouch, in the vicinity of South Fambridge, Essex. Flying rights up to the coast have been purchased, and there is thus available a straight course (a mile wide) of 25 miles at low tide. In securing this site, Mr. Billing has also taken over the buildings which were formerly occupied by a small colony of workmen engaged in a large engineering factory, as well as the factory itself. The workshops, in their present form, will make admirable aeroplane sheds, since one of them measures no less than 125 ft. by 111 ft. and is 75 ft. high, while another measures 111 ft. by 56 ft. and is 30 ft. high. There are doors 70 ft. wide at each end of the larger shop, and the buildings, besides being floored with concrete, are fitted with travelling cranes. An electric light plant is already installed, moreover, and there is a water-tower available for the service of the workshops and the houses. The surrounding land, which will form the

aerodrome proper, is all "reclaimed land," and, in its present natural state, it is sufficiently smooth and firm for cycling upon. The nearest station, Fambridge, is situated about a mile to the north side of the Crouch, but it is within easy access of the ground, on the south, *via* a ferry. Motorists can, of course, go down by road, and aeroplanes can be delivered practically at the doors of the aero dock by water.

Some idea of the magnitude of the property which Mr. Billing has acquired can be obtained from the accompanying illustrations, which serve to elucidate the following explanation of the general lines upon which the owner intends to proceed at once. He is having the large workshop partitioned off on each side of the main aisle into a series of lock-up sheds, where experimenters can work in private upon their machines. But the main aisle itself will be reserved for general work; and the head-room beneath the rafters will be requisitioned for storing aeroplanes which are temporarily out of use. A



**FAMBRIDGE FLIGHT GROUNDS.**—Views of the carpenters' shop (on left) and of one of the private aero docks.



FAMBRIDGE FLIGHT GROUNDS.—The Club House (1); hotel (2); post and telegraph office (3); water tower and electric plant house (4), with bungalows, &c., in background.

staff of men is to be kept on, under a responsible foreman, for the common use of all experimenters, each of whom will be required to contribute a nominal sum of about 10s. a week to the wages fund. The actual number of men will, of course, be in proportion to the number of experimenters who are actively at work at any particular time. A moderate yearly rental—the sum at present suggested is £50 per annum—will be charged for each lock-up shed; and this will also include the use of the main building, with such machinery and appliances as it contains. Aviators will have the further advantage of being able to reside in the immediate vicinity, for they will have the first call on the four-roomed bungalows which are to be made available at a rental of about 3s. per week. Among other facilities which this unique and ready-made aerodrome possesses is a post-office, which already has a telegraph, and is about to be put on the telephone. Combined with it is a general stores, and near by is an hotel, as well as a conveniently-situated club-house. Exclusive of these buildings, the bungalows number twenty, and the brick cottages account for twelve more. For all practical purposes, it may be taken that the actual limits of the flying rights are represented by the River Crouch on the north, from Fambridge right down to Foulness Island and Foulness Sands; by Hockley on

the south, and by a line about 9 or 10 miles from Fambridge on the west.

The only stipulation which Mr. Billing desires to make with those who share the use of his property, is that they shall give evidence of a patriotic side to their work. And this they are to do by associating themselves with his general scheme, viz., that of founding the nucleus for an aerial fleet, which it is proposed to call the "Imperial Flying Squadron." It will be observed that Mr. Billing's proposals are of a very ambitious and praiseworthy nature; and that they are essentially intended to imbue the sporting side with a militant national aspect of a definite kind. As such, we hope that this "Colony of British Aerocraft" (as Mr. Billing proposes to call it) may meet with immediate success.

The first machine which will probably be tried will be a Pischoff, fitted with a Dutheil-Chalmer engine. One of these aeroplanes was shown at the recent Paris Salon, and that which is to inaugurate flight at Fambridge is expected to be at the Olympia Exhibition prior to being taken down there. It is probable that the undertaking as a whole will have a commercial side, for we understand that aeroplanes will be built on the spot, and that Mr. C. E. Whittaker, who is also associated with the scheme, is in the meantime making arrangements whereby officers of the "Squadron" can obtain Belgian-built machines at cost price.



FAMBRIDGE FLIGHT GROUNDS.—The row of 4-roomed bungalows available for the use of aviators.



# AN ILLUSTRATED GLOSSARY OF TERMS USED IN "FLIGHT."

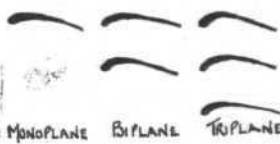
THERE are certain terms made use of in connection with flight and flying machines which are a little outside the ordinary conversational vocabulary and have no exact equivalent in automobilism. In France, as in England, many of these terms have been adopted in a purely arbitrary manner but have become established by common consent. For the benefit of our readers, we give the following brief list of the more important expressions; and have included the corresponding French words where necessary. The English terms are those which obtain throughout the text of FLIGHT:—

**Aeroplane:** Any motor-driven flying machine which relies upon surfaces for its support in the air. (Fr. *Aéroplan.*)



PLANES

**Monoplane:** An aeroplane with one main pair of outstretched wings. (Fr. *Monoplan.*)

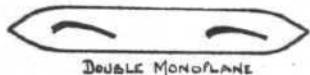


**Biplane:** An aeroplane with two main planes superposed, i.e., double-decked. (Fr. *Biplan.*)

**Triplane:** An aeroplane with three main planes superposed. (Fr. *Triplan.*)

(In any of the above, the use of supplementary small planes in the form of tails or keels, &c., does not affect the classification.)

**Double Monoplane:** An aeroplane with two pairs of outstretched wings, one pair behind the other.



DOUBLE MONOPLANE

**Triple Monoplane:** An aeroplane with three pairs of outstretched wings, arranged one behind the other.

**Stepped Monoplane:** An aeroplane in which two or more pairs of wings are mounted fairly close behind one another, but at noticeably different levels, like a row of steps. (Fr. *En escalier.*)



STEPPED MONOPLANE

**Glider:** A flying machine without a motor.

**Helicopter:** A flying machine in which propellers are utilised to give a lifting effect by their own direct action on the air. The term is derived from two Greek words—*helix* = whirling, and *pteron* = a wing. Hence, literally, a whirling wing, or in mechanics a screw-propeller. In aviation, the use of the term implies that the screw exerts a direct lift. (Fr. *Hélicoptère.*)



HELICOPTER

**Orthopter:** A flapping wing machine which obtains a direct lifting effect by beating the air with flat or straight wings. The prefix (*orthos*) implies a regular or straight surface; the suffix means "wing." (Fr. *Orthoptère.*)

**Ornithopter:** A flapping wing machine which has arched wings like those of a bird (*ornithos*). (Fr. *Ornithoptère.*)

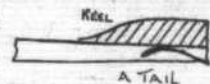
**Wings:** The pair of main outstretched surfaces on a monoplane. This term is usually confined to monoplanes as being more descriptive of the type. (Fr. *Ailes.*)



WINGS

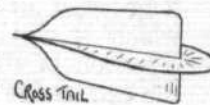
**Plane:** Any surface. (Fr. *Plan.*) The French employ the term *les ailes* to denote the main planes of multi-plane as well as monoplane flying machines.

**Tail:** The plane or group of small planes at the rear end of the machine, utilised more for the purpose of conferring automatic stability than for giving support. (Fr. *Empennage.*)



A TAIL

**Cross-Tail:** A tail formed by intersecting vertical and horizontal planes.



CROSS TAIL

**Rudder:** The plane or planes which steer the machine sideways. (Fr. *Gouvernail de direction.*)



RUDDER

**Elevator:** The plane or planes which, by being tilted or dipped, make the machine rise or fall. (Fr. *Gouvernail de profondeur.*)



ELEVATOR

(The adjectives "double," "triple," "biplane," &c., applied to rudders and elevators signifies that two or three similar planes are placed parallel to one another to form a complete unit.)

**Righting Tips:** Little pivoted wings, usually forming extensions of the



STEERING TIP

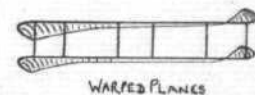
main wings or planes, for the purpose of assisting in the maintenance of equilibrium, and also for steering, with or without the assistance of the rudder. When one tip dips the other tilts. (Fr. *Ailerons.*)

**Warping:** The flexing or springing of a plane out of its normal shape. (Fr. *Gauchissement des ailes.*) It is understood to imply that the rear edges near the planes or extremities of wings



WARPED WINGS

are tilted and dipped, respectively, to create a temporary difference in their inclinations. This enables the wind to heel the machine back again into balance.



WARPED PLANES

**Frame:** In French, the term "chassis" is sometimes used, but more often the word "fuselage" on account of the bodies of most monoplanes being spindle-shaped (*fusiform*).



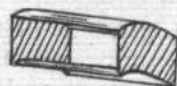
GIRDER FRAME FUSELAGE

**Half-Elliptic Frames:** A frame of the fusiform type which has been curtailed at the middle.

**Keel:** A vertical plane or planes arranged longitudinally either above or below the body for the purpose of giving stability. At present these are only to be observed in monoplanes. See Tail. (Fr. *Quille.*)

**Curtains:** Vertical planes between horizontal planes, thus forming the structure into a kind of box-kite. These are often employed near the extremities of a biplane.

**Box-kite:** Expression denoting a structure consisting of two horizontal planes joined by two side curtains.



BOX-KITE

**Multi-cellular:** A structure virtually consisting of a row, or rows, of box-kites.



MULTICELLULAR

**Propeller :** For the sake of distinction we prefer to reserve this term for screws which push the aeroplane, thus leaving the term :—

**Screw :** For a device which pulls the machine (tractor-screw) or exerts a lifting effect (lifting-screw). In French, the term *hélice* applies to a propeller in any position.

**Hangar :** The French term for the shed or aeroplane garage.

**Aerodrome :** A field or place set apart for the practice of flight.

**Arched :** This term denotes that the long edge of a plane or wing which is at right angles to the direction of the machine's motion, is curved, so that the extremities of the plane, or the tips of the wings, sweep downwards.



**Cambered :** This term denotes that the plane or wing has a curved transverse section. In practice, every flexible aeroplane surface becomes more or less cambered under the air pressure, but many are made so initially.



**Inclination :** The inclination of a plane is its angle to the horizontal. When a plane is very wide in proportion to its spread, its inclination sometimes differs from point to point, which gives it a cambered appearance.



**Spread, Span :** Synonymous terms denoting the linear dimension of the front edge of a main supporting plane or pair of wings, *i.e.*, the distance from tip to tip, measured transversely to the direction of flight.

**Width :** The width of a plane is the distance from the front edge to the rear edge, measured in the line of flight.

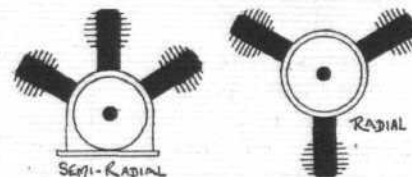
**Length :** This term is applied to the machine as a whole and not to the planes. It is a dimension measured from the nose to the tail.

**Gap :** The distance between two superposed planes measured vertically.

**Dihedral :** Term denoting that the planes or wings are arranged V fashion. The early Santos Dumont machines were dihedral biplanes.



**Semi-radial Engines :** Engines which are of the radial type, but have all their cylinders arranged within a half-circle.



**Tilt and Dip :** Tilt implies that an edge has been moved upwards from its initial position; dip implies the contrary.



## AERO CLUB OF THE UNITED KINGDOM.

### OFFICIAL NOTICES TO MEMBERS.

#### Committee.

The following members have been nominated up to date for the nine vacancies on the Committee :—

Griffith Brewer.	Frank McClean.
Major C. de W. Crookshank.	C. A. Moreing.
John Dunville.	C. F. Pollock.
Capt. A. H. W. Grubb.	J. Lyons Sampson.
Prof. A. K. Huntington.	Stanley Spooner.

Any two members of the Club can nominate a member to serve on the Committee, having previously obtained such member's consent. The name of such member so nominated, with the names of his proposer and seconder, must be sent to the Secretary, in writing, on or before Saturday, 27th February, 1909.

#### Gordon-Bennett Balloon Race, 1909.

Members are reminded that entries close on March 1st, 1909. The rules were published in the official notices of January 30th.

#### Gordon-Bennett Aviation Cup.

Members are reminded that entries close on Feb. 27th, 1909. Full particulars will be found in the official notices of February 6th, 1909.

#### Aero Exhibition at Olympia.

The Aero Exhibition at Olympia, held by the Society of Motor Manufacturers under the auspices of the Aero Club of the United Kingdom, will take place in March, opening on the 19th and terminating on the 27th. Members of the Aero Club will be admitted free on production of their Aero Club membership cards. A room will be placed at the disposal of the members during the Exhibition.

Free space will be granted to non-trade members of the Aero Club and the Aero Club League for exhibiting

their machines, and applications should be made as early as possible to the Secretary of the Aero Club, 166, Piccadilly, London, W.

#### Model Flying Machines at Olympia.

It is proposed to organise an exhibit of model flying machines at Olympia in connection with the Aero Exhibition in March. Those desirous of exhibiting are requested to communicate with the Secretary of the Aero Club, 166, Piccadilly, London, W., as soon as possible. Money prizes, medals, and diplomas will be awarded by the Aero Club of the United Kingdom. Free space will be given to exhibitors.

#### Reading Room for Members.

A number of members are possibly not aware that the Club have a reading room at 166, Piccadilly. Papers dealing with aviation are placed at the disposal of the members, and the Committee are taking steps to form a library.

#### Balloon Photographs.

A Silver Medal will be awarded for the best eight sets of photographs taken by a member from a balloon during the year 1908. Members are requested to forward the photographs to the Secretary by March 31st, 1909.

#### New Members.

The following new members have been elected to the Aero Club :—

George S. Barwick.	John Kennedy, J.P.
R. A. Collingwood.	Col. F. G. Stone, R.A.
Eric Hartridge.	

HAROLD E. PERRIN,  
Secretary.

The Aero Club of the United Kingdom,  
166, Piccadilly, W.



## NEWS OF THE WEEK.

### Aero Exhibition at Olympia.

A FEATURE of the Aero Exhibition, which opens at Olympia on March 19th, will be a series of cinematograph shows which will be given in the Annexe twice each evening, the programme including pictures of flights made by prominent aviators. These will be supplemented by a series of pictures of motor boat racing, &c. The whole of the space available for aeroplanes has been applied for, and the applications for space in the marine section are more numerous than was the case last year. It is proposed that these exhibits should be placed round the main hall under the gallery. The band of the Coldstream Guards will play three times daily during the time the Exhibition is open, from March 19th to 27th inclusive.

### A Record Lady Passenger Flight.

WILBUR WRIGHT, since his removal to Pau, had not until Monday taken any of the fair sex as passengers with him. On that day he placed his sister Katherine in the enviable position of record holder for lady passenger flights, brother and sister remaining aloft for about seven minutes. Prior to this the Countess de Lambert was Wilbur Wright's passenger for three minutes.

### King Alfonso and his Impending Visit to Pau.

INTEREST, which in its intensity is locally becoming excitement, centres around the possibility of an impending visit to Pau from His Majesty King Alfonso XIII of Spain. It is quite impossible to say definitely what ultimately will happen, but the King of Spain is unquestionably most keen on learning to fly. The Spanish Court, on the contrary, are just as dead against it. That His Majesty will visit San Sebastian is regarded as certain, but whether he will invite Wilbur Wright to go over there, or whether, on the other hand, he will take matters in his own hands and go to Wilbur Wright, is a question which events of the next few days alone will decide.

### Pau Weather.

So much has been said about the temperateness of the Pau climate, that the rigour of the present specimen, which has now been in force for some few days past, must be a severe disappointment to a good many people. On several occasions it has snowed hard, and the cold has been intense. It snowed on both occasions when Mr. Balfour visited the aerodrome, but very considerably the Clerk of the Weather called a halt for an hour, so that the ex-Premier was not altogether disappointed, inasmuch as he was able to witness two short flights of 20 mins. and 5 mins. each. He was disappointed in not being able to accompany Mr. Wright, however, but the American was not inclined to take the risk on such a day, so that Mr. Balfour's actual physical association with the machine ended with his assistance in hauling it to the starting point.

### A British-Built Aeroplane.

AN aeroplane which is being built by Mr. Jack Humphrys, a member of the Aero Club, is well on the way to completion. He hopes to have it ready in time for the Aero Exhibition at Olympia in March. The machine is on entirely new lines and has been specially designed to prove that the aeroplane can be useful for naval purposes. The whole machine is British made.

### Legagneux Flies the Voisin-Farman.

LEGAGNEUX, who is taking Farman's aeroplane to Vienna for delivery to the syndicate who have bought it, made a trial flight of 5 kiloms. at Mourmelon le Grand on February 14th. At his first attempt he succeeded in flying 2 kiloms., and immediately afterwards made the 5 kiloms. flight already mentioned. On Monday he further increased his record by flying for 10 kiloms.

### Farman May Go to Vienna.

ALTHOUGH Legagneux has been making such good flights with the aeroplane which he is taking to Austria, there is a rumour that Farman may go there to make



WILBUR WRIGHT AT PAU.—A group of flyers and the "King of Flyers." Wright's new hangar and "residence" is seen in the background. Reading from left to right are MM. Bleriot, Tissandier, Lucas Gerardville, Wilbur Wright, M<sup>me</sup>. Hart O. Berg, Count de Lambert, and Miss Katherine Wright.

the trial flights. These will probably be made in the vicinity of the Imperial Palace at Schœnbrunn, so that the Emperor, who is taking a keen interest in the affair, may be able to witness the flights.

## Moore-Brabazon and His Engines.

MR. MOORE-BRABAZON is trying another engine on one of the Voisin aeroplanes, and this time it is an E.N.V. 8-cyl. motor which he has selected.

## Moore-Brabazon Flies Easily.

WITH the new engine Moore-Brabazon has got along much more smoothly in his flying. On Wednesday, at Issy, in the early morning, he repeatedly made circular kilometre flights without the smallest sign of effort, his machine behaving splendidly. So much so, that he already sees himself on the way for a long flight. His biplane is to be transferred to Chalons, where a special hangar is now being erected, and he then intends to try for some more ambitious records, bringing him a little nearer to the top than the fifth place at present reached by him.

## Farman Makes Passenger Flights.

FARMAN has been experimenting with passenger flights, and practically throughout Sunday last, Feb. 14th, was making attempts in this direction. In the afternoon he succeeded in the course of one of these flights in covering a distance of 5 kiloms.—a very fine performance.

## Bleriot's Opinion of Pau.

DISCUSSING his recent visit to Pau, one day last week, M. Bleriot made a definite statement to the effect that he certainly intended to take his flying machines there if nothing hindered him. He witnessed Wright make a few flights, and was impressed by the excellence of the ground and the fine weather.

## Esnault Pelterie Re-commencing.

AT his Buc aerodrome, Esnault Pelterie is getting ready to re-commence his trials, prior to which he has been engaged in testing a new carburettor for his engine.

## Ordt Aeroplane in the Alps.

AN aeroplane has been constructed by M. Auffm Ordt for experimental work in the Engadine, and as it will be used over the snow and ice it has been fitted with skis instead of wheels. The engine is rated at 30-h.p., and the weight of the machine is 220 kilogs.

## Groos Aeroplane.

A SUB-LIEUTENANT of Artillery, M. Groos, has designed an aeroplane embodying some original features, with which he contemplates making experiments near Vannes. With this object in view he approached the Morbihan Syndicat d'Initiative and the Armoricaire Automobile Club, who have taken the matter up, and have founded a joint committee on aviation. It is a member of this committee, Count Dillon, who has placed his property at Pen-en-Toul—as reported last week—at their disposal for an aerodrome.

## M. Guffroy Flies on R.E.P. Machine.

ON Tuesday, after going through a couple of days' training at M. R. Esnault Pelterie's aerodrome at Buc, M. Maurice Guffroy, despite the mist, succeeded in making several short flights on the R.E.P. 2-bis monoplane, which he has entered for the Gordon-Bennet Cup. The longest flight measured nearly 70 metres. On Wednesday he was continuing his experiments, and succeeded in making a flight of 800 metres, which was

brought prematurely to an end through an extraordinary accident. He failed when turning to quite clear a bank about 12 ft. high, and as a result of the collision the machine completely turned turtle. Marvellous to relate, as the monoplane was travelling at a speed of 80 kiloms. an hour, M. Guffroy escaped unhurt, and the only damage to the machine was a broken propeller.

## Rougier to take to the Air.

ONE of the latest aspirants to aerial fame is Rougier, the well-known driver of Lorraine-Dietrich racing cars. He has chosen for his mount a Voisin biplane, fitted with an Antoinette motor, with which he intends to compete at Monaco. Pending the delivery of the machine, he is studying the subject at the Lorraine-Dietrich works.

## Bleriot Flies at Issy.

M. BLERIOT again made several flights with his little monoplane, "Bleriot XI," at Issy on Tuesday. He circled round the parade ground, but touched the earth three times. Subsequently a free flight was made for a distance of 600 metres. These new trials still further demonstrated the stability of the machine, and there is little doubt that when M. Bleriot goes to Pau he will be able to continue to add to his laurels.

## Demanest Flies at Chalons.

ON Tuesday M. Demanest, on the Antoinette monoplane, in spite of the violent wind and the bad state of the weather generally, made a flight of about 400 metres at Chalons Camp.

## Baylac Helicopter.

AN engineer of Bordeaux, named M. Baylac, is preparing designs for a new helicopter, which is expected to be ready early in the summer. The machine will be fitted with four screws, two set vertically and two horizontally, and will also be fitted with some form of aeroplane.

## Rheims Meeting.

THE C.A.M., having considered the report of its delegates who were appointed to meet the Rheims Local Committee on the subject of holding an Aviation Week at Rheims, have approved the carrying through of the scheme on the following lines. The prize fund of 160,000 francs established by the Rheims Local Committee will be attributed by the C.A.M., who are to control the meeting, to five events, as follows:—1. Duration test; 2. 30 kilom. speed race; 3. Speed race over a circular course; 4. High flight trial; 5. Passenger flight trial. The events will be held on the plains of Betheny, and the meeting will be officially known as "La Grande Semaine de Champagne."

It has been largely due to the activity of the Marquis de Polignac that the proposal to hold this meeting has been carried through, but he has had the very able support of Count de la Vaulx. Together they have ensured conditions which will render the events perfectly feasible, having regard to the progress in flight which has taken place to date; in fact, the Marquis himself has stated that so far as this matter is concerned the prizes "are already won." It is quite likely that in the general enthusiasm which prevails as a result of the C.A.M. decision, that the prize fund will rise to 200,000 francs in value.

## Rheims Circuit and Anjou Aviation Week.

SINCE a definite decision has been arrived at to hold an aviation meeting at Rheims, the rival claims of the



Champagne district with that of Anjou have opened up a new field for discussion in French aeronautical circles. Now that matters have got thus far, there is very little reason to doubt but that these two centres will between them dispose of the principal aviation events this year. It has been definitely decided to hold the Gordon-Bennett Flight Cup Race at Rheims on the 29th of August, but it is still an open question as to whether the Anjou Week will include the competition for the Aero Club Grand Prix. It is regarded, nevertheless, as practically certain that this will be the case, and under these circumstances the two meetings will probably have an equal interest to the public at large.

### The Gordon-Bennett Flight Cup.

THE Gordon-Bennett Flight Cup, as already mentioned, will be competed for this year at Rheims on August 29th, and should any eliminating trials be necessary these will take place, also at Rheims, on August 23rd.

### Nice Model Trials.

THE model trials which are being organised at Nice will include two classes. Class A will be open to gliders without motors; the models will be suspended at a definite height above the ground by strings, and will be liberated by their respective inventors, who will cut the strings, but may not touch their machines. The classification will be according to the distance which the gliders accomplish when thus liberated. Class B will be open to models fitted with elastic or other means of propulsion, and these also must be started without being pushed off. Three attempts will be permitted to each competitor.

### Summer Exhibition in Paris.

A SCHEME is afoot in Paris to hold an Aeronautical Exhibition in the Grand Palais between August 20th and October 20th, at which show nothing but aeronautics will be represented. An important committee, including MM. Darracq, Michelin, Bleriot, Pelterie, Mangin, Clemenceau, and many others prominent in the world of flight, formed a deputation to M. Dujardin Beaumetz, who has the control of the Grand Palais, with a view to pointing out the advantage that such an Exhibition would be to the new-born industry. As the result of their visit

they received a promise from M. Beaumetz that he would certainly make a favourable report upon their request. The date chosen, it will be noticed, overlaps the Rheims week, and it is presumably anticipated that the competing machines might afterwards be placed on view at the Grand Palais, thereby to re-create in Paris the enthusiasm which they are sure to arouse in the Champagne district.

In connection with this project, at a subsequent meeting of those interested it was decided to form a *Union des Industriels de la Locomotion Aerienne*, with M. Esnault Pelterie as President, MM. A. Clement, Mallet and Michel Clemenceau as Vice-Presidents, and M. Granet as Secretary. M. Bleriot was nominated for the presidency, but he withdrew in favour of M. Pelterie. In addition to these officers, the Executive Committee consists of MM. Darracq, Dussand, Bleriot, Mangin, and Michelin. It was decided to hold the Exhibition from the 2nd to the 17th October.

### Exhibition at Frankfort.

AN aeronautical exhibition will be held at Frankfort-on-Main, between July 10th and October 10th this year.

### Union Francaise Aerienne.

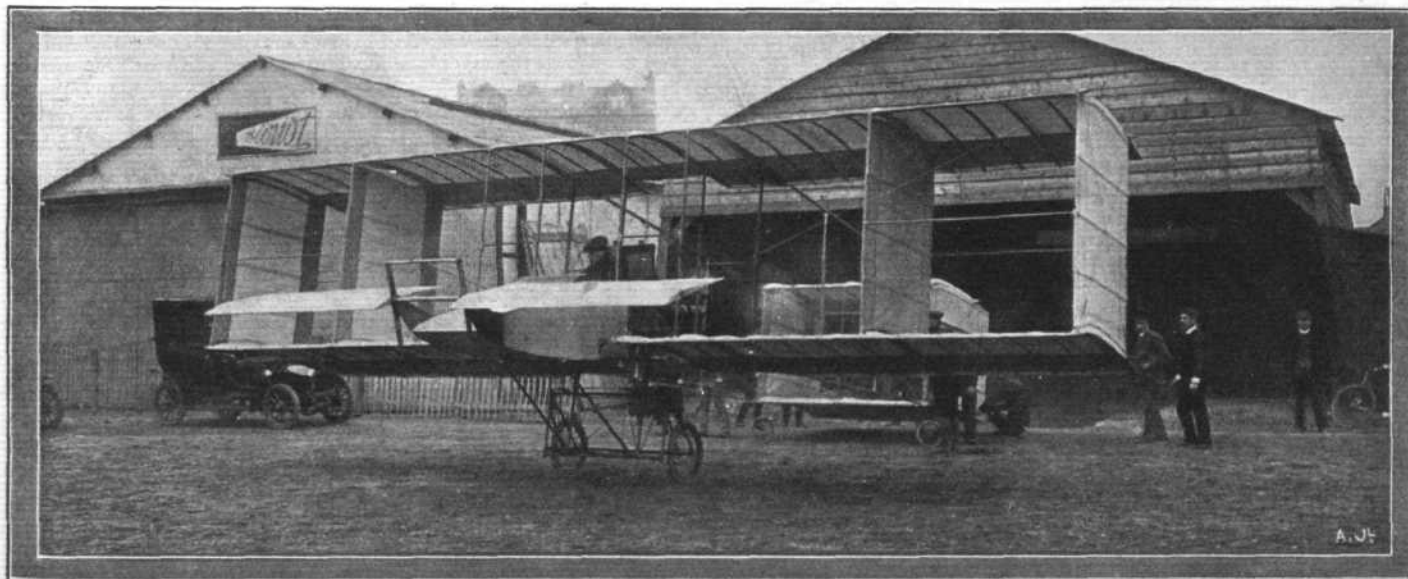
A SOCIETY has been founded at Toulon under the above title, with the object of giving pecuniary assistance to inventors of flying machines. We can imagine that this society will have a busy time.

### Airship Commission.

THE Aero Club of France has formed a special committee to deal with airships, and M. Deutsch de la Meurthe has been elected as President of this section. The Vice-Presidents are MM. Julliot, Santos Dumont, and Clement. The Secretary is M. Chauviere. In the course of one of its early meetings, the subject of erecting airship sheds at important places throughout the country will be brought under discussion, as also will be the question of the economic supply of pure hydrogen. A Government grant will be obtained if possible with a view to the organisation of a competition for dirigibles.

### Monaco to Corsica by Airship.

M. JACQUES FAURE, who has made many balloon trips, is contemplating an airship flight from Monaco to Corsica, a distance of about 110 miles.



Mr. J. T. C. Moore-Brabazon on his Voisin biplane, which has been fitted with an 8-cyl. 50-h.p. E.N.V. water-cooled motor.

## A Kite-Flying Club.

JUST as yacht and ship designers have learnt a great deal from experiments with models, so students of aeronautics have obtained a great deal of valuable information from the flying of kites, and, as we announced about a month ago, the Kite Flying Association of Great Britain has been formed to bring together all those interested in this form of flight. A meeting is to be held in Caxton Hall, Westminster, on Saturday, the 27th inst., at 2.30 p.m., when the President (Major Baden-Powell) will give an address on the objects of the Association. The annual subscription is 5s., and the Hon. Secretary is Mr. W. H. Akehurst, 27, Victory Road, Wimbledon, S.W.



## MECHANICAL FLIGHT.\*

By E. STUART BRUCE, M.A.

(Concluded from page 98.)

THE area of the sustaining surfaces is 50 square metres. The weight of the whole machine (with aviator) is about 450 kilogs. Levers under the control of the aviator regulate the various functions of the machine, the flexing of the carrying surfaces, the movements of the horizontal rudders, the vertical rudder, &c.

For starting, the machine runs on rollers along a single wooden rail, but when there is no wind the catapult apparatus has often been used. This consists of a skeleton pylon stand; at the top of this there is a weight attached to a cord passing through a pulley. The free end of the cord is passed through a pulley at the remote end of the line and brought back and attached to the car by a patent catch. When the weight is allowed to fall the machine is shot forward with starting impetus, enabling the flight to commence. The weight is 700 kilogs., and it falls 5 metres.

While the world was waiting for the details of the Wrights' machine, another type of aeroplane machine came into existence in France, which may be described as an unbending type, and which is devoid of the vital principle of movable main surfaces, which would appear to give the Wright machine a great margin of safety in windy weather. The first of these machines was the bird of prey of M. Santos Dumont. Rudely simple was it in its construction. Two box kites for the supporting surface. In the centre is the motor with the screw behind. To attain flight the machine is run upon wheels until a certain speed is attained, when the machine takes flight. Mr. Farman's machine is another example of a machine that does not bend its wings to adapt itself to circumstances, but still we are bound to confess that the feats which Mr. Farman has managed to perform with his machine, which many critics will say is a less perfect type than that of the Brothers Wright, are very much to his credit. Our national sympathies have been very much with Mr. Farman in his experiments, for though they have taken place in France, the experimenter is of British descent.

Amongst the more recent feats of Mr. Farman may be mentioned his town to town journey from Chalons to Rheims. Another example of the same school is M. Delagrangé's aeroplane, and this has accomplished no unworthy flights. In fact, at one time, this last summer, M. Delagrangé held the officially observed record for duration of flight, 29m. 53s., until this was greatly surpassed by Mr. Orville Wright.

In practical aeroplane travelling there will be two great difficulties to be overcome, one, starting; two, stopping in the air. As has been mentioned above, there are at the present time two methods of starting employed, that of the Brothers Wright, who use starting appliances that are independent of the machine, the other that of the French school, who use wheels which are part of the machine itself. There are disadvantages with either method. It would be hardly practical to carry a huge starting catapult, or even rails, on an aeroplane, and the system of running on the ground on wheels to start would not be practicable in a ploughed field, while the speed required would be prohibited on a public road. For this reason, some think that the helicoptere, or lifting screw flying machine, will have advantages over the aeroplane, as the lifting horizontal screws will enable it to rise from any place at any time, and also endow it with the power of stopping horizontal motion without descending.

Possibly the future flying machine will consist in the combination of the aeroplane and lifting screw systems. In the way of safety

\* Abstract of a paper read before the Royal Society of Arts on Wednesday, December 2nd, 1908.

## Gordon-Bennett Balloon Cup.

THE Swiss Aero Club, who were awarded the victory in the last Gordon-Bennett Balloon Race, have specified Zurich as the starting point for this year's event. The date has not yet been definitely fixed, but it will probably be either September 26th, October 1st, or October 10th. The Swiss Aero Club will be represented by two balloons, Germany has entered three balloons, as also has Italy, while the United States has entered one balloon. The French Club have not yet come to a definite decision. In previous years the entries have closed on January 31st, but this year they will be accepted up to March 1st.



there will be undoubtedly an advantage in retaining the aeroplane surface in case of falls, even though it may not be adjusted to support a certain weight, like a parachute. In the case of Mr. Orville Wright's accident, the spread of canvas to some extent retarded the fall. In the opinion of Mr. Orville Wright, had the accident happened higher up in the air he would have been able to right the machine, and glide safely to earth with it.

Concerning the fall of an aeroplane through accident, such as the collapse of a motor, or even the gliding down purposely without motor action when near to ground, I would like to make a suggestion. If arrangements could be devised to suddenly make the sustaining surfaces convex when about to descend, a safe descent would probably be much facilitated. When I take a flat strip of paper and let it fall, in the majority of cases it will fall revolving rapidly, a fact first pointed out by Maxwell and afterwards commented upon by Lord Rayleigh as a fact that has not been completely explained. But if I curve up the ends of this strip very slightly, the strip generally falls to the floor without turning over. If I let the strip fall ten times in succession, it will probably maintain its stability throughout the test. This is, I think, an experiment worth a practical test.

While on the question of means of securing safety, in may perhaps be suggested that in experimental flights it would be advisable if the operator and his companions provided themselves with parachutes, which probably in the future will come to be regarded as the life-buoys of flying machines. It would be possible for parachutes to be so suspended that the weight of the aviators suddenly thrown on to them would release them. Probably the best form of parachute will be found to be one with a rotary fall, a principle that has yet to be worked out. The sycamore seed in falling affords an example of a rotary parachute.

There are some who say that the experiments of the Brothers Wright show that the conquest of the air is complete. But those who speak thus grasp not the situation. It is true that the Brothers Wright have, this year, shown that mechanical flight is possible in a calm atmosphere, and in slight breezes, and this is in itself a triumph. But before we can say man has mastered the great problem of flight, he must fly not only in tranquil airs and slight breezes, but against strong winds and treacherous gusts. Then only will he have wrested from the sea-gulls their long-guarded secret, when, like them, he can use the swift moving air currents to aid his flight. When the aeroplane has encountered the storm, and sailed in its midst undisturbed, and come back safe to port, then, and then only, can he say that, for everyday practical use, the aeroplane has come.

There will, too, be much to be learnt concerning the tricks and ways of aerial currents, even in more tranquil airs. The following simple experiment may suggest how the balance of an aeroplane may be unexpectedly upset by an uprising current of air.

When the wind blows against a cliff or steep hill there is produced an upward current of air. Now imagine an aeroplane comfortably travelling and maintaining its equilibrium and stability. When it reaches the region of the cliff and the sudden uprising current, there will be a great chance of its equilibrium or stability being upset.

In view of the possibility of man acquiring, like soaring birds, the power of making use of the vertical component of the wind, the internal work of the wind, i.e., its gustiness, and even the non-uniformity of wind, i.e., its different velocities at different levels, it would seem important that every light that can be thrown upon the difficult subject of equilibrium and stability, experimentally and mathematically, should be eagerly sought. In connection with the subject of "longitudinal stability," I should like to call special attention to the remarkable researches of Professor G. H. Bryan and Mr. W. E. Williams.



In the course of a few remarks on gliding flight which Professor Bryan made in the course of a Friday evening discourse at the Royal Institution in 1901, it seemed to me evident that he had a greater grasp of the mathematical side of the problem of aerial navigation than had been previously evidenced, and, at my request, he wrote the remarkable mathematical discourse on the subject which was read before the Aeronautical Society of Great Britain on December 3rd, 1903.

The remarks of Professor Bryan as to the distinction between equilibrium and stability—a distinction not very generally appreciated—may perhaps with advantage be here quoted:—

"We say that the motion of a flying machine is steady when the resultant velocity is constant in direction and magnitude, and when the angle of the machine to the horizontal is constant. If this motion is slightly disturbed, the machine may either return after a time to the original motion, or it may take up a new and altogether different mode of motion. In the first case, the steady motion is said to be stable, and the second unstable.

"It is evidently necessary for steady motion of any kind that there should be equilibrium—i.e., that there should be no forces acting on the machine (apart from accidental disturbances) which tend to vary the motion, and hence it follows that the number of modes of steady motion of which a machine is capable is, in general, limited, and that when an unstable, steady motion is disturbed, the new mode of motion taken up is entirely different from the old.

"It is necessary to distinguish carefully between equilibrium and stability, as the two are very often confused together. Equilibrium is necessary to secure the existence of a mode of steady motion, but is not sufficient to ensure the stability of the motion.

"The question of the stability of a rigid body moving under the action of any forces has been solved by Routh. In order to apply his results to the stability of flying machines, it is necessary to know the moment of inertia of the machine about its centre of gravity, the resistance of the air on the supporting surfaces as a function of the velocity and angle of incidence, and also the point of application of this force, i.e., the centre of pressure for different angles of incidence. If these are known for the surfaces constituting any machine, then the problem of its stability for small oscillations can be completely solved. Unfortunately, our knowledge of these points is very unsatisfactory. Several valuable series of experiments have been made to determine the resistance on planes, but there is still some doubt as to the position of the centre of pressure at small angles of incidence, especially for oblong planes, and very little indeed is known as to the movement of the centre of pressure on concave surfaces. Until experiments are made on this point it will be impossible to solve the problem of stability for machines supported on concave surfaces."

The last words of Professor Bryan emphasise the necessity of laboratory research, as well as continuing our experiments in the open. Regarding experiments as to the movement of the centre of pressure on concave surfaces, it may be hoped that when the Brothers Wright publish the full results of their own laboratory researches, light on this subject will be forthcoming.

The photographs of the paths of aerial gliders taken by Professor Bryan and Mr. W. E. Williams are suggestive of the utility of further photographic research on a larger scale. These photographs were taken by attaching magnesium wire to small gliders, consisting of square planes and pairs of square planes, and allowing them to descend in front of a camera in a dark room with the wire burning. By placing a rotating wheel in front of the camera, a dotted instead of a continuous track was obtained, enabling the velocities at different points to be compared. When the path is nearly straight two sets of oscillations are observed. If either of these oscillations increases as the glider descends, the glider will be longitudinally unstable.

With regard to the equilibrium and stability problem, we have not yet got quite beyond the utility of observations with gliding models in the open. There is much yet that might be learnt as to the behaviour of various forms of sustaining surfaces. An instance of very successful and instructive glides (with models) was afforded on the occasion of the kite display, at Sunningdale, in 1907, the experimenter being Mr. José Weiss. His demonstration of the possibility of the maintenance of balance for a considerable distance, with a model launched from a hill-top, was one that should encourage himself and others in further research into the difficult problems of soaring flight. He exhibited three model gliders, having wing areas of 3.6, 8.4, and 12.8 sq. ft., with total weights of 2½ lbs. and 15 lbs. respectively, the lead ballast in each case representing about two-thirds of the total weight. When launched from the highest hillock available the best glides obtained were some 200 yards in length, with drops from 30 to 50 ft. The small model, raised some 200 ft. by a large kite, and released from that height, righted itself instantly in each case, and gave some very fine glides, the longest being about 600 yards. Some further comparative tests of this description might prove useful. Professor Bryan

has suggested that model flying machines might advantageously be fitted with instruments to register stability.

In connection with aerial navigation, a line of research, the importance of which cannot well be overestimated, are those investigations which deal with the motions of the medium of travel. Thanks to the indefatigable efforts of Dr. William Napier Shaw, the investigation of the upper air is forming a feature of the work of the Meteorological Office, and most important results have been obtained. Such investigations are all essential for the progress of meteorology; but they are equally important for the advance of aerial navigation, and their continuance and extension is worthy of the heartiest national support.

It has been said that the ideal flying machine will be attained by a system of automatic stability. Since Mr. Brennan showed how a train could travel on a mono-rail and keep its stability by the application of the gyroscope, a new hope has arisen that the gyroscopic principle may be so applied to flying machines as to render them automatically stable. Simple experiments with the ordinary gyroscopic top shows us that rotary motion can annul the effects of forces other than gravity.

Though we are yet in a stage of experimental flight, and much has to be learnt in theory and practice before it can be adapted to the requirements of daily life, still even in its partially developed state the aeroplane may prove to be a potent factor of war. Under the cogent force of necessity the slenderest threads may have a power that in peace and prosperity would never be accorded them.

I will forebear the discussion of the much vexed question as to whether, when frontiers are obliterated and war made hideously terrible by the flying machine, there will come the end of strife. But at any rate we may hope that the common paths of the air that will unite nations will remove many prejudices and prolong the blest hours of peace.



## CORRESPONDENCE.

\* \* The name and address of the writer (not necessarily for publication) MUST in all cases accompany letters intended for insertion, or containing queries.

### AERONAUTICAL TERMINOLOGY.

To the Editor of FLIGHT.

SIR,—You are shortly, as per your issue of January 30th, going to place before your readers a glossary of terms applicable to aeronautical science. The immediate necessity of doing so must be apparent to all; for in a short period words frequently used by the Press will have a tendency to become fixed, and it will be of great advantage, therefore, that such be very carefully and scientifically thought out by those competent to do so. I venture to suggest that you first submit your list to the Council of the Aeronautical Society of Great Britain, and also to the Committee of the Aero Club (the two paramount associations in this country), indicating to both bodies the necessity for dispatch in making any suggested alterations they propose; this could, with a little energy, combined with early notices to those concerned, be readily accomplished at one meeting. Then, what you deemed advisable of such revision, could be published in your excellent periodical, on the understanding that terse criticisms are invited from your numerous readers, after which the whole would become permanent.

A most important factor in the arrangement of this glossary appears to be, that, as far as possible, the language should be concise and quite distinctive, preferably words of one or two syllables, as indicated in your introductory article of January 2nd, for in these pushful go-ahead times, any lengthy forms of speech are bound to be cut down by popular usage into possibly objectionable non-euphonious sounds. The Aeronautical Society, due to its scientific trend, would be prone to suggest polysyllabic expressions derived from the usual ancient sources, but this would be counteracted by the sportive tendencies of the Aero Club into a usable up-to-date form.

The wrong method to base this important subject is painfully evident in the deplorable verbose hash produced by the "Permanent International Aeronautical Commission" in 1903 (*vide Aeronautical Journal*, Vol. VII, No. 26). However, that being for International intercourse may be left for awhile, this glossary is presumably British.

A few items from present aeronautical literature may be commented on as examples:—

"Aeroplane," as used by "the man in the street," due, perhaps, in the first instance, to the aforesaid Permanent I. A. Commission, and also to its misapplication by the Press generally, but more particularly to the insistence of the *Daily Mail*, to which popular paper we aeronautical students and sportsmen owe so much otherwise, is a most detestably objectionable and unscientific term, which, of course, should only be used to denote a flat surface. Instead, for a

machine heavier-than-air, the true distinctive expression should decidedly be, "flying machine," comprising "flyers," "gliders," "soarers," &c. As to the last, although it is quite palpably evident why Mr. O. L. Chanute and others have used the words "sailing-flight," the already universal use of "soaring-flight," which fully and exactly describes the action, makes a word annexed from nautical nomenclature quite superfluous.

"Lift" and "drift" are good examples of the language that is required, the word "aerofoil" (coined by Mr. Lanchester), descriptive of the whole supporting surfaces, is excellent; a portion of that surface, e.g., a single wing of a bird or its equivalent in a machine could appropriately be named a "curvane," a curved supporting surface, whilst "aeroplane" is relegated to its obviously proper place. Your advocacy of "aerodrome" is, I think, right, due mostly to the present Continental usage, but the argument on the other side was also good.

What is much needed are words definitely and authoritatively applicable to measurements; we want badly a precise expression relating to "fore and aft" measurement; "longitudinal" is inaccurate referring to length, the accepted meaning of which is the greatest distance, whereas this measurement in a flyer is shortest; "transverse" might very well refer to measurement from tip to tip, usually incorrectly called the breadth; depth, of course, would be used, as in other things, to indicate from above to below.

"Flying machines," as stated, should be used to represent the heavier-than-air section; the "floating machines," that is the lighter-than-air type, are usually designated balloons, air-ships, dirigibles, &c., which words, being very suitable, might well be retained.

Yours faithfully,

Farnboro', Kent.

C. H. M. A. ALDERSON.

## ACCUMULATORS FOR MODELS.

To the Editor of FLIGHT.

DEAR SIR,—Re Mr. Caton's letter in FLIGHT, Feb. 13th, I stated that the weight of my accumulator is  $2\frac{1}{2}$  lbs. Mr. Caton at once assumed that the accumulator is of an ordinary type, and gives it a power capacity of 4 volts, 10 ampère hours, 40 watts or  $\frac{1}{3}$  E.H.P. This would be correct on the above assumption that it is 10 ampères; but I have gone much further than this in development, mine being 15 ampère-hour capacity.

Taking Mr. Caton's figures as a basis, this would give a power capacity of 4 volts, 15 ampères, 60 watts or  $\frac{1}{3}$  E.H.P. But I go much further than this; I can short-circuit my accumulator without damage to the plates, and draw all the available working current in 15 secs. This has been done on four different occasions, and the accumulator is still efficient.

I made the plates myself, and sent them to a well-known accumulator maker to put into a case. When it was returned to me it was marked by this maker 15 ampère-hour; and the capacity cannot be questioned, as they had no interest in giving a wrong capacity.

The plates are specially made, and are not the usual plates.

I again reiterate, that I have said nothing to mislead, but have only made a bare, plain statement of facts, showing what can be done if anyone cares to try.

Should anyone try to run an aeroplane model with such an accumulator as illustrated in the figures of Mr. Caton they will not succeed, as I have found to my cost, having at present a dozen such, all of no use for such work, and, as Mr. Caton says, only good for ignition.

Flight 5, as mentioned by me, cannot be taken in any way as showing the trend of my opinions with regard to motive power for aeroplanes, large or small. As it stands at present, petrol is the source of power for large aeroplanes, and other sources of power are more or less suitable for models, the choice of which rests entirely with the means and ideas of the experimenter.

I must refuse *in toto* to give the type of machine as used by myself until I have recouped my expenditure, and I may say if I did give it, it would be entirely misleading without other details, as I have entirely altered a certain type in its main aspects, and yet it still comes under its particular heading.

Yours very truly,

Stoke Newington, Feb. 15th.

MONTFORD KAY.

## THE ORVILLE WRIGHT ACCIDENT.

To the Editor of FLIGHT.

SIR,—In an article contained in your issue of the 13th inst., entitled "Mechanical Flight," Mr. E. Stuart Bruce makes a statement which is contrary to what I always understood. He says that Mr. Orville Wright's accident was due to the fact that his propellers were made of wood. In his words: "As is well known, Mr. Wright had extended the length of his propellers. In rotating, one of them struck a wire hanging loosely, and broke."

Now, Sir, I always understood that it was the wire that broke, and that, as the wire was the connection to the vertical rudder, Mr. Wright lost control of his machine.

Would it trouble you to inform me which is correct? I ask for information.

Mr. Bruce makes another statement, contained in his last sentence: "Had the propeller been made of suitable metal, it would probably not have been broken by the impact."

I do not wish to appear as a captious critic of Mr. Bruce's interesting article, but is it not rather a debatable point, whether metal is better than wood? Sir Hiram Maxim recommends the latter material, as he considers that there is more skin friction with a polished metallic surface than with a piece of smooth, evenly-lacquered wood. In the propellers which I saw in France, those made of metal all had a rib up the back, projecting considerably from the blade, which must have created a considerable amount of friction, and resulted in loss of power.

Yours faithfully,

A.R.B.

Kensington, Feb. 13th.

## THE LIFT OF PROPELLERS.

To the Editor of FLIGHT.

SIR,—In the current issue of FLIGHT, I see that Mr. F. E. Wilson states that three tons have been lifted by means of vertical screws driven by 80 h.p. This works out at 84 lbs. lift per h.p., yet some time ago I saw it stated that a lift of 33 lbs. per h.p. was phenomenal. I think it would be very interesting and instructive to many of your readers if you would give the following information:—

1. What is the equivalent of 1 h.p. in lift or thrust?
2. What is the greatest lift per h.p. that has been obtained in practice by means of screws?

Mr. Wilson also writes that the Wrights' aeroplane has lifted 84 lbs. per h.p., but this is very different from the engine doing it directly. It was stated a short time ago that the thrust necessary to drive this aeroplane was about 150 lbs., which works out at about 2 h.p., according to the results said to have been obtained by Mr. Davidson. Since the Wrights' engine is said to be of about 27 h.p., and the efficiency of their screws 75 per cent., there appears to be a considerable difference in the various results.

Yours faithfully,

LEO.

Bromley, Kent, Feb. 16th.

## PROPELLERS AND MOTORS.

To the Editor of FLIGHT.

SIR,—As far as can be gathered from Mr. Kay's letter of last week, he now agrees with my contention, *i.e.*, that the *size* only of a well-designed propeller need be made to suit the aeroplane, and that the *proportions* need not be altered. Obviously, a larger or a smaller diameter propeller has larger or smaller pitch and blade area.

There is a fixed proportion of maximum efficiency, and this, I claim, is embodied in my propeller. My propeller has been genuinely tested, independently of the "Voisin" not "against" it (whatever that may mean), with result that "were highly favourable to the Hollands," whether compared with the *known* results of the "Voisin" or of any other propeller.

If the Frenchmen are too short-sighted or conservative to "jump at" a good thing when offered—and not even to try it—the loss and the fault are theirs. There are those in England who recognise its merits. Mr. Kay must have seen the published testimonials to its high efficiency and general excellence.

Referring now to the inquiry of my old acquaintance, Mr. Wilson. I condemn helicoptère systems because, wherever *fairly* tried and tested, they have been found to demand a much greater power ratio than in systems of horizontal propulsion, and this is generally admitted.

Yours faithfully,

SIDNEY H. HOLLANDS.

York, Feb. 15th.



## NEW COMPANIES REGISTERED.

W. J. Harvey, Ltd., 463, Oxford Street, W.—Capital £10,000, in £1 shares. Manufacturers of and dealers in motor cars, aeroplanes, &c., acquiring the business carried on by Burgess and Harvey, Ltd., at 463, Oxford Street, W.



## Aeronautical Patents Published.

Applied for in 1908.

Published February 25th, 1909.

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| 22,809. | E. PERKS. Flying machines.   |
| 23,907. | O. RICARDONI AND G. A. CROCCO. Dirigible aerostat airships.  |
| 27,598. | F. E. BERRUBE. Means for launching explosive projectiles by means of a dirigible balloon or airship. |